

Claims:

1 1. A power management system for a computer system having one or more different
2 components wherein power is dynamically supplied to each component, the power management
3 system comprising:

4 a clock generator circuit for generating one or more different clock signals wherein each
5 clock signal has a different predetermined frequency;

6 a clock selector circuit that, based on the task being performed by the computer system,
7 dynamically adjusts the clock signal supplied to each component of the computer system in order
8 to reduce the total power being consumed by the computer system.

1 2. The system of Claim 1 further comprising a static power management system
2 wherein power is withdrawn from components that are not currently active to reduce the power
3 consumption of the computer system.

1 3. The system of Claim 2, wherein the static power management system further
2 comprises a circuit for disconnecting the address, control data in and data out pins of a
3 component of the computer system in order to reduce the power consumption of the computer
4 system.

1 4. The system of Claim 1, wherein the clock generator circuit further comprises a
2 first oscillator that generates a first clock signal, a second clock oscillator that generates a second
3 clock signal, a programmable clock circuit that generates a third clock signal based on the second
4 clock signal, and a clock select circuit that selects one of the first, second and third clock signal
5 that is supplied to a portion of the computer system to provide that portion of the computer
6 system with a predetermined clock signal.

1 5. The system of Claim 4, wherein the clock select circuit further comprises a clock
2 state machine for determining the clock state of the computer system at a predetermined time and
3 a clock policy circuit for generating control signals to the clock select circuit in order to output
4 the appropriate clock signal.

1 6. The system of Claim 5, wherein the clock state machine further comprises an idle
2 state wherein the computer system is waiting for an input, a busy state wherein the computer

3 system is performing a task, a sleep state wherein the computer system has timed out due to
4 inactivity and a dead state wherein power has failed to the computer system.

1 7. The system of Claim 6, wherein the clock select circuit further comprises a circuit
2 that generates a system clock, a circuit that generates a processor clock and a circuit that
3 generates a co-processor clock wherein each of the clocks is independently and simultaneously.

1 8. The system of Claim 6, wherein, during the idle state, the clock select circuit
2 generates no clock for the phase locked loop and co-processor so that they are off, the clock
3 select circuit generates the first clock signal for the processor so that the processor is clocked at a
4 slow rate and the clock select circuit generates a high rate clock for an interrupt circuit so that the
5 interrupt circuit is active and can increase the clock frequency for the computer system quickly.

1 9. The system of Claim 6, wherein, during the busy state, the clock select circuit
2 generates a high rate clock signal for the processor, the co-processor and the interrupt circuits.

1 10. The system of Claim 6, wherein, during the sleep state, the clock select circuit
2 generates no clock signal for the processor and the co-processor.

1 11. The system of Claim 5, wherein the clock state machine is controlled by an
2 interrupt signal and software commands.

1 12. The system of Claim 4, wherein the programmable clock circuit generates a fourth
2 clock signal.

1 13. The system of Claim 12, wherein the first, second, third and fourth clock signals
2 have different frequencies.

1 14. The system of Claim 13, wherein the first clock signal frequency comprises 32
2 kHz, the second clock signal frequency comprises 24 Mhz, the third clock signal frequency
3 comprises 33 Mhz and the fourth clock signal frequency comprises 66 Mhz.

1 15. The system of Claim 4 further comprises a time of day circuit that generates time
2 of day clock signals based on the first clock signal.

1 16. The system of Claim 4, wherein the clock select circuit further comprises means
2 for dynamically changing the clock frequency applied to each component of the computer system
3 based on the task being performed by the computer system.

1 17. The system of Claim 4, wherein the clock select circuit comprises a multiplexer.

1 18. The system of Claim 4, wherein the programmable clock generator further
2 comprises a prescalar unit and a post scalar unit whose outputs are fed into a phase locked loop
3 that generates a third clock signal and a fourth clock signal having different frequencies.

1 19. A power management method for a computer system having one or more different
2 components wherein power is dynamically supplied to each component, the power management
3 method comprising:

4 simultaneously generating one or more different clock signals wherein each clock signal
5 has a different predetermined frequency;

6 dynamically adjusts the clock signal supplied to each component of the computer system
7 in order to reduce the total power being consumed by the computer system.

1 20. The method of Claim 19 further comprising static power management method
2 wherein power is withdrawn from components that are not currently active to reduce the power
3 consumption of the computer method.

1 21. The method of Claim 20, wherein the static power management further comprises
2 disconnecting the address, control data in and data out pins of a component of the computer
3 method in order to reduce the power consumption of the computer method.

1 22. The method of Claim 19, wherein the clock generation further comprises
2 generating a first clock signal with a first oscillator, generating a second clock signal using a
3 second oscillator, generating a third clock signal based on the second clock signal, and selecting
4 one of the first, second and third clock signal that is supplied to a portion of the computer system
5 to provide that portion of the computer system with a predetermined clock signal.

1 23. The method of Claim 22, wherein the clock select further comprises determining
2 the clock state of the computer system at a predetermined time and generating control signals to
3 the clock select in order to output the appropriate clock signal.

1 24. The method of Claim 23, wherein the clock state machine further comprises an
2 idle state wherein the computer method is waiting for an input, a busy state wherein the computer
3 method is performing a task, a sleep state wherein the computer system has timed out due to
4 inactivity and a dead state wherein power has failed to the computer system.

1 25. The method of Claim 24, wherein the clock select circuit further comprises
2 generating a system clock, generating a processor clock and generating a co-processor clock
3 wherein each of the clocks is independently and simultaneously.

1 26. The method of Claim 24, during the idle state, generating no clock for the phase
2 locked loop and co-processor so that they are off, generating the first clock signal for the
3 processor so that the processor is clocked at a slow rate and generating a high rate clock for an
4 interrupt circuit so that the interrupt circuit is active and can increase the clock frequency for the
5 computer method quickly.

1 27. The method of Claim 24, during the busy state, generating a high rate clock signal
2 for the processor, the co-processor and the interrupt circuits.

1 28. The method of Claim 24, during the sleep state, generating no clock signal for the
2 processor and the co-processor.

1 29. The method of Claim 23, wherein the clock state machine is controlled by an
2 interrupt signal and software commands.

1 30. The method of Claim 22 further comprising generating a fourth clock signal.

1 31. The method of Claim 30, wherein the first, second, third and fourth clock signals
2 have different frequencies.

1 32. The method of Claim 31, wherein the first clock signal frequency comprises 32
2 kHz, the second clock signal frequency comprises 24 Mhz, the third clock signal frequency
3 comprises 33 Mhz and the fourth clock signal frequency comprises 66 Mhz.

1 33. The method of Claim 22 further comprises a time of day circuit that generates
2 time of day clock signals based on the first clock signal.

1 34. The method of Claim 22, wherein the clock select circuit further comprises means
2 for dynamically changing the clock frequency applied to each component of the computer
3 method based on the task being performed by the computer method.

1 35. The method of Claim 22, wherein the clock select circuit comprises a multiplexer.

1 36. The method of Claim 22, wherein the programmable clock method further
2 comprises a prescalar unit and a post scalar unit whose outputs are fed into a phase locked loop
3 that generates a third clock signal and a fourth clock signal having different frequencies.

1 37. A flexible clock generator, comprising:

2 a first oscillator that generates a first clock signal;

3 a second clock oscillator that generates a second clock signal;

4 a programmable clock circuit that generates a third clock signal based on the second
5 clock signal; and

6 a clock select circuit that selects one of the first, second and third clock signal that is
7 supplied to a portion of the computer system to provide that portion of the computer system with
8 a predetermined clock signal.

1 38. The generator of Claim 37, wherein the clock select circuit further comprises a
2 clock state machine for determining the clock state of the computer system at a predetermined
3 time and a clock policy circuit for generating control signals to the clock select circuit in order to
4 output the appropriate clock signal.

1 39. The generator of Claim 38, wherein the clock state machine further comprises an
2 idle state wherein the computer system is waiting for an input, a busy state wherein the computer
3 system is performing a task, a sleep state wherein the computer system has timed out due to
4 inactivity and a dead state wherein power has failed to the computer system.

1 40. The generator of Claim 39, wherein the clock select circuit further comprises a
2 circuit that generates a system clock, a circuit that generates a processor clock and a circuit that
3 generates a co-processor clock wherein each of the clocks is independently and simultaneously.

1 41. The generator of Claim 39, wherein, during the idle state, the clock select circuit
2 generates no clock for the phase locked loop and co-processor so that they are off, the clock
3 select circuit generates the first clock signal for the processor so that the processor is clocked at a
4 slow rate and the clock select circuit generates a high rate clock for an interrupt circuit so that the
5 interrupt circuit is active and can increase the clock frequency for the computer system quickly.

1 42. The generator of Claim 39, wherein, during the busy state, the clock select circuit
2 generates a high rate clock signal for the processor, the co-processor and the interrupt circuits.

1 43. The generator of Claim 39, wherein, during the sleep state, the clock select circuit
2 generates no clock signal for the processor and the co-processor.

1 44. The generator of Claim 38, wherein the clock state machine is controlled by an
2 interrupt signal and software commands.

1 45. The generator of Claim 37, wherein the programmable clock circuit generates a
2 fourth clock signal.

1 46. The generator of Claim 45, wherein the first, second, third and fourth clock
2 signals have different frequencies.

1 47. The generator of Claim 46, wherein the first clock signal frequency comprises 32
2 kHz, the second clock signal frequency comprises 24 Mhz, the third clock signal frequency
3 comprises 33 Mhz and the fourth clock signal frequency comprises 66 Mhz.

1 48. The generator of Claim 37 further comprises a time of day circuit that generates
2 time of day clock signals based on the first clock signal.

1 49. The generator of Claim 37, wherein the clock select circuit further comprises
2 means for dynamically changing the clock frequency applied to each component of the computer
3 system based on the task being performed by the computer system.

1 50. The generator of Claim 37, wherein the clock select circuit comprises a
2 multiplexer.

1 51. The generator of Claim 37, wherein the programmable clock generator further
2 comprises a prescalar unit and a post scalar unit whose outputs are fed into a phase locked loop
3 that generates a third clock signal and a fourth clock signal having different frequencies.